



NEW ACADEMIC PROGRAM – MAJOR Preliminary Proposal Form

I. Program Details

- a. **Name (and Degree Type) of Proposed Academic Program:** MS in AI for Business
 - i. **Emphases (if applicable):**
- b. **Academic Unit(s)/College(s):** MIS Department/Eller College of Management
- c. **Intended Campus/Location(s):** Tucson-Main, AZ Online
Note: *if UA Online is a desired option, please contact them at azonline-info@arizona.edu to inquire about their review process. Listing it here does not guarantee it will be an approved program for the ONLN campus.*
- d. **Desired CiP Code:** 11.0102
- e. **First Admission Term:** Fall 2025
- f. **Primary Contact and Email:** Sue Brown, MIS Department Head, suebrown@arizona.edu

II. Executive Summary (please provide **no more** than 5 bullets/sentences that sum up the rationale, demand, and uniqueness of your proposed major. This will be read at ABOR.):

Artificial intelligence is a fast-growing field; according to [PwC's 2024 Global AI Jobs Barometer](#), postings for AI jobs are growing 3.5 times faster than for all jobs. The MS in AI for Business program is uniquely positioned to provide students with knowledge and skills in AI methods and applications as well as managerial insights related to AI governance, including ethical use of AI and regulatory compliance. Geared toward technically oriented students, the program is for working professionals who wish to expand and enhance their understanding of and ability to apply AI tools and techniques. Additionally, it offers an opportunity for students to gain applied knowledge within a set of subdisciplines, such as cybersecurity and healthcare. The program is housed in the top-ranked MIS Department and is built on 35 years of experience in AI, as the Eller MIS AI Lab was established in 1989.

III. Brief Program Description: *You must work with [your college marketing lead](#) to develop a description for the proposed program. This will appear in the catalog and other public-facing platforms such as college websites, Degree Search, etc. Considering an audience of prospective and current students and their families, state the purpose and nature of the curriculum, highlighting the knowledge and skills students will develop, as well as faculty expertise and emphases (if any), etc. Typically, 1-2 paragraphs, no more than 100-250 words.*

The MS in AI for Business program provides an opportunity to gain knowledge, skills in AI methods and applications, and managerial insights regarding AI governance, including ethical use of AI and regulatory compliance. In just 12 months, students acquire the technical expertise necessary to advance their careers through AI implementation in business. The program involves theoretical and hands-on

learning approaches to grasp critical AI concepts, principles, and practices. The curriculum includes data mining and machine learning courses, generative AI for business, deep learning, policy and ethics of AI for business, and graphs and networks, all set within an applied business context. Additionally, students can focus on various real-world applications across disciplines such as healthcare management, cybersecurity, and digital platforms.

- IV. **Program Rationale:** *In consultation with proposing unit's college-level administration, describe how the proposed academic program fits within the mix of programs currently offered by the college, and how it advances the overall mission of the college and university. To support the proposed program, does the college envision sharing resources used by other programs, redeploying internal resources, etc.?*

The MIS Department offers an MS MIS program and an MS Cybersecurity program, both of which are online. The MIS Online population attracts professionals who want to pivot to MIS from other fields, so they may not be interested in or prepared for a program as technical as the MS in AI for Business. The Cybersecurity program is highly specialized and attracts a niche population of professionals from the cybersecurity industry, who are unlikely to be interested in a cross-sectional degree such as the MS in AI for Business.

The program advances the mission of the university by mapping to the Wildcat journey, specifically creating UA's 4IR story. It advances Eller's mission by correlating to one of Eller's strategic priorities: "the Forefront of Transformation—the Frontline of Business Technology." AI is at the frontline of business technology today.

The program is a natural extension of our current MIS programs and will complement them nicely. In fact, we anticipate that a subset of our current MS MIS students will be interested in obtaining a dual degree in AI for Business to further differentiate themselves. In addition, the National Science Foundation (NSF) is currently exploring opportunities to leverage AI in its scholarship for service (SFS) programs. One option they are considering is AI for Cybersecurity, which would open doors for students pursuing the MS in Cybersecurity to add the MS in AI for Business as a dual degree option. We have recently received our third award for SFS, which will put us at 15 years of support in cybersecurity and position us well if NSF adds AI as an option. It also positions us well to attract additional funding if NSF moves to an SFS program purely for AI.

- V. **Viability:** *To support the proposed program, does the college envision sharing resources used by other programs, redeploying internal resources (consolidating existing programs), etc.?*

- a. Summarize new resources required to offer the program: *may include additional faculty, staff, equipment, facilities, etc.*
We anticipate a combination of sharing resources used by other programs and redeploying internal resources. We also expect some additions.

In terms of sharing resources, three of the required courses and many of the electives are currently offered as part of our MS MIS and MS Cybersecurity programs. Given that we plan to initially launch this program online, we will not be constrained by the physical space of a classroom in terms of seats. In addition, our colleagues on campus have highlighted several classes that can also be used for elective purposes.

In terms of redeploying resources, the Eller College recently instituted a 2-for-1 teaching approach such that faculty who teach online courses onload will be required to teach two online classes to count as one teaching credit. We will be able to leverage this in some instances to get additional teaching for this program.

Finally, the MIS Department's recruiting plans are focused on faculty who have expertise in AI.

We currently have a recruiting and advising staff for our online programs. Since we plan to initially launch this for the online campus, these resources will be leveraged for the new program. With the anticipated enrollment, distributed across six starts per year, the current staff feel they can handle the additional students. We currently have approximately 180 students enrolled across our MS MIS and MS Cyber programs. We have two staff members who recruit and advise students. The anticipated increase will alter the advisor to student ratio from 1:90 up to 1:115 in year three, assuming steady state in the other programs. Our graduate online students tend to require less advising than our main campus students. Thus, assuming these enrollments, we do not anticipate needing additional staff for the first three years.

Current computing resources on campus will be sufficient for the program.

VI. **Projected Enrollment for the First Three Years:**

Year 1	Year 2	Year 3
20	35	50

VII. **Evidence of Market Demand:** *Please provide an estimate of the future state-wide and national demand for graduates of the proposed academic program. [Curricular Affairs](#) can provide a job posting/demand report (from Lightcast) by skills obtained/CIP code of the proposed major. If job market data is unavailable or not applicable, please explain why and elaborate another justification for the proposed program.*

The [World Economic Forum's "Future of Jobs Report 2023"](#) asserts the projected growth for the field, noting that the demand for AI and machine learning specialists is anticipated to grow by approximately 40 percent from 2023 to 2027. Furthermore, [Glassdoor](#) estimates that the total pay range for an entry level AI engineer is between \$101K and \$189K. A [US Labor Market Update](#) from March 2024 found that AI jobs are once again on the rise, particularly in the software development field.

Additional state-wide and national data are not as easily accessible due to the nascent stage of the AI sector. However, the University of Arizona recently [announced](#) plans to offer a new bachelor's degree in artificial intelligence, and Arizona State University launched an MS in Artificial Intelligence in Business program based on anticipated demand in the region.

According to a report from National University (<https://www.nu.edu/blog/key-factors-to-land-an-ai-job/>), about 75% of job openings in AI specified Master's level as a requirement or a preference. A CompTIA report suggests that just over half of employers have a preference for Master's or higher degrees for dedicated AI jobs (<https://www.ciodive.com/news/AI-jobs-masters-degrees/719972/#:~:text=Three%2Dquarters%20of%20employers%20seek,job%20posts%20by%20National%20University.>). All in all, the demand for advanced degrees – from students and employers – is well above what is available (<https://thepienews.com/demand-for-ai-big-data-ux-design-outpacing-supply/>).

VIII. **Similar Programs Offered at Arizona Public Universities:**

Arizona State University offers a Master of Science in Artificial Intelligence in Business program. It launched in Fall 2024.

IX. **Resources**

a. **Summarize new resources required to offer the program:** *may include additional faculty, staff, equipment, facilities, etc.*

We currently have a recruiting and advising staff for our online programs. Since we plan to initially launch this for the online campus, these resources will be leveraged for the new program. With the anticipated enrollment, distributed across six starts per year, the current staff feel they can handle the additional students. We currently have approximately 180 students enrolled across our MS MIS and MS Cyber programs. We have two staff members who recruit and advise students. The anticipated increase will alter the advisor to student ratio from 1:90 up to 1:115 in year three, assuming steady state in the other programs. Our graduate online students tend to require less advising than our main campus students. Thus, assuming these enrollments, we do not anticipate needing additional staff for the first three years.

Our current faculty are keen to increase the AI in the curriculum and we anticipate adjustment and sunseting of a few courses as we move in this direction. In addition, the Eller College has implemented a 2 for 1 policy for online classes. This means that the faculty who are currently teaching their online classes on load will be required to add an additional online class to receive full load credit. We anticipate these two things will cover the majority of our needs for this program during the initial online launch years. That said, if we allocate costs directly to the program, based on Eller's overload rates, we expect to spend approximately \$373,000 in year one to cover the teaching costs, course development costs, and administration costs. Gross revenue with 20 students is projected to be just under \$480,000.

X. Required Signatures (the following should be included in the notification memo to campus after ABOR approval):

a. Program Director/Main Proposer:

i. Signature: 

ii. Name and Title: Susan A. Brown, Department Head, MIS

iii. Date: 9.10.2024

b. Managing Unit/Department Head:

i. Signature: 

ii. Name and Title: Susan A. Brown, Department Head, MIS

iii. Date: 9.10.2024

c. College Dean/Associate Dean:

i. Signature: 

ii. Name and Title: Karthik Kannan, Dean

iii. Date:



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1. **MAJOR REQUIREMENTS**— complete the table below by listing the major requirements, including required number of units, required core, electives, and any special requirements, including emphases* (sub-plans), thesis, internships, etc. Note: information in this section must be consistent throughout the proposal documents (comparison charts, four-year plan, curricular/assessment map, etc.). Delete the **EXAMPLE** column before submitting/uploading. Complete the table in Appendix A if requesting a corresponding minor.

GRADUATE

Total units required to complete the degree	30
Pre-admissions expectations (i.e., academic training to be completed prior to admission)	<p>Earned bachelor’s degree</p> <p>Applicants are required to take an entry test to establish their basic technical knowledge in statistics, Python, and SQL. If they do not pass, they will be required to take extra classes in each of the units they did not pass.</p> <p>Applicants who have not received the equivalent of 6 credit hours in business courses are required to take the equivalent of 6 credits of foundational business courses from among the following (each is 2 credits):</p> <ul style="list-style-type: none"> ● FIN 510A/FIN510B: Financial Management ● MKTG 510: Market-Based Management ● OSCM 560: Operations Management ● ECON 550: Economics for Managers.
Major requirements. List all major requirements including core and electives. If applicable, list the emphasis requirements for each proposed emphasis*. Courses listed must include course	Complete 6 core courses (18 units) and at least 1 Special Topic the student can select from a list of 4.



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<p>prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.</p>	<p>Core: 6 courses (18 units):</p> <ul style="list-style-type: none"> -MIS 545 (3) Data Mining and Machine Learning -MIS 584 (3) Big Data Technologies -MIS 548 (3) Introduction to Deep Learning -MIS 556 (3) Generative AI for Business -MIS 550 (3) Policy and Ethics of AI for Business -MIS 551 (3) Graphs and Networks <p>Special Topics (choose 1 to 4): (3 to 12 units)</p> <ul style="list-style-type: none"> -MIS 552 (3) AI for Digital Platforms -MIS 553 (3) AI for Healthcare -MIS 555 (3) AI for Cybersecurity -MIS 554 (3) AI for Business Intelligence <p>For remaining credits, students can choose courses among Special Topics and Electives.</p> <p>Electives: 6 courses (select remaining units) (0 to 9 units)</p> <ul style="list-style-type: none"> -MIS 562 (3) Cyber Threat Intelligence -MIS 587 (3) Business Intelligence -MIS 547 (3) Cloud Computing -MIS 561 (3) Data Visualization -OSCM 571 (3) Optimization and Decision Support Modeling for Business -ECON 511A (3) Econometrics - INFO 557 (3) Neural Networks - INFO 555 (3) Applied NLP - CYBV 525 (3) Cyber Physical Systems
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	- CYBV 535 (3) Secure Critical Infrastructures and Artificial Intelligence Additional electives will be added as appropriate as new courses are developed on campus.
Research methods, data analysis, and methodology requirements (Yes/No). If yes, provide description.	No
Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	No
Master thesis or dissertation required (Yes/No). If yes, provide description.	No
Additional requirements (provide description)	N/A
Minor options (as relevant)	No required minor options.

*Emphases are officially recognized sub-specializations within the discipline. [ABOR Policy 2-221 c. Academic Degree Programs Subspecializations](#) requires all undergraduate emphases within a major to share at least 40% curricular commonality across emphases (known as “major core”). Total units required for each emphasis must be equal. Proposed emphases having similar curriculum with other plans (within department, college, or university) may require completion of an additional comparison chart. Complete the table found in Appendix B to indicate if emphases should be printed on student transcripts and diplomas.

- I. **CURRENT COURSES**—using the table below, list all existing courses included in the proposed major. You can find information to complete the table using the [UA course catalog](#) or [UAnalytics](#) (Catalog and Schedule Dashboard> “Printable Course Descriptions by Department” On Demand Report; right side of screen). If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head’s permission to include the courses in the proposed program and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the “Letter(s) of Support” field on the UAccess workflow form. Add or remove rows to the table, as needed.

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)



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MIS 545	3	Data Mining and Machine Learning (core)		In-person, online	F (in-person), Sp, Su (online)	
MIS 584	3	Big Data Technologies (core)		In-person, online	F (second 7 weeks online)	
MIS 548	3	Introduction to Deep Learning (core)	MIS 545 (data mining and machine learning)	In-person, online	Sp (second 7 weeks online)	
MIS 562	3	Cyber Threat Intelligence (elective)		Online	F (second y weeks)	
MIS 587	3	Business Intelligence (elective)		In-person, online	Sp (in-person), F (second 7 weeks online)	
MIS 547	3	Cloud Computing (elective)		In-person, online	F (first 7 weeks online)	
MIS 561	3	Data Visualization (elective)		In-person, online	F (in person) Su (first 7 weeks online)	
OSCM 571	3	Optimization and Decision Support Modeling for Business (elective)		In-person, online	Sp (second 7 weeks online)	
ECON 511A	3	Econometrics (elective)		In-person, online	F (online tbd)	yes
INFO 555	3	Applied NLP		In-person, online	F, Sp, Su 16 weeks	Yes
INFO 557	3	Neural Networks		In-person, online	F 16 weeks	Yes
CYBV 525	3	Cyber-Physical Systems		Online	F, Sp, Su (first 7 weeks)	Yes
CYBV 535	3			Online	F, Sp, Su (second 7 weeks)	Yes



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II. **NEW COURSES NEEDED** – using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (i.e., CHEM 4XX). Add rows as needed.

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Status*	Anticipated first term offered	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)	Faculty members available to teach the courses
MIS 556	3	Generative AI for Business (core)		Online	S	Summer 2026	Su (first 7 weeks)	Yes	Ge, Yong
MIS 550	3	Policy and Ethics of AI for Business (core)		Online	S	Summer 2026	Su (second 7 weeks)	Yes	Brandimarte, Laura
MIS 551	3	Graphs and Networks (core)		Online	S	Fall 2025	F (first 7 weeks)	Yes	Ram, Sudha
MIS 552	3	AI for Digital Platforms (special topics)		Online	A	Spring 2026	Sp (second 7 weeks)	Yes	Ge, Yong
MIS 553	3	AI for Healthcare (special topics)		Online	S	Fall 2025	F (first 7 weeks)	Yes	Leroy, Gondy
MIS 555	3	AI for Cybersecurity (special topics)		Online	S	Summer 2026	Su (second 7 weeks)	Yes	Chen, Hsinchun
MIS 554	3	AI for Business Intelligence (special topics)		Online	A	Spring 2026	Sp (first 7 weeks)	Yes	Chen, Hsinchun

*In development (D); submitted for approval (S); approved (A)

Click or tap here to enter text.

III. **FACULTY INFORMATION-** complete the table below. If UA Vitae link is not provided/available, add CVs to a Box folder and provide that link. UA Vitae profiles can be found in the [UA directory/phonebook](#). Add rows as needed. Delete the EXAMPLE rows before



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submitting/uploading. **NOTE: full proposals are distributed campus-wide, posted on committee agendas and should be considered “publicly visible”.** Contact [Office of Curricular Affairs](#) if you have concerns about CV information being “publicly visible”.

Faculty Member:	Involvement	UA Vitae link or Box folder link
Laura Brandimarte	Teach MIS550	https://arizona.app.box.com/folder/269420721231
Hsinchun Chen	Teach MIS 554; MIS 555	
Yong Ge	Teach MIS 548; MIS 552; MIS 556	
Gondy Leroy	Teach MIS 553	
Sudha Ram	Teach MIS 551; MIS 487	
David Weber	Teach MIS 545	
Seokjun Youn	Teach MIS 584; OSCM 571	
Zara Ahmad-Post	Teach MIS 547	
Tara Mysak	Teach MIS 561	
Agrim Sachdeva	Teach MIS 562	
Tiemen Woutersen	Teach Econ 511A	



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IV. **GRADUATION PLAN** – provide a sample degree plan, based on your program that includes all requirements to graduate with this major and takes into consideration course offerings and sequencing. *Undergraduate programs: please complete [Addendum D: 4-Year Plan for Degree Search](#). Use generic title/placeholder for requirements with more than one course option (e.g., Upper Division Major Elective, Minor Course, Second Language, GE). Add rows as needed.*

Accelerated Plan (fall, spring, summer) [C=core, E=elective, ST=special topic]

Semester 1		Semester 2		Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
MIS 551 (C)	3	MIS 545 (c)	3	MIS 556 (C)	3		
MIS 553 (ST)	3	MIS 554 (ST)	3	MIS 550 (C)	3		
MIS 584 (C)	3	MIS 548 (c)	3				
MIS 587 (E)	3	MIS 552 (ST)	3				
Total	12	Total	12	Total	6	Total	

Semester 5		Semester 6		Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
Total		Total		Total		Total	



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Anticipated Plan as most online students take 6 or less credits per semester (fall, spring, summer, fall, spring) [C=core, E=elective, ST=special topic]

Semester 1		Semester 2		Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
MIS 551 (c)	3	MIS 545 (c)	3	MIS 556 (c)	3	MIS 553 (st)	3
MIS 584 (c)	3	MIS 548 (c)	3	MIS 550 (c)	3	MIS 587 (e)	3
Total	6	Total	6	Total	6	Total	6

Semester 5		Semester 6		Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
MIS 554 (ST)	3						
MIS 552 (st)	3						
Total	6	Total		Total		Total	

- V. **Learning Outcomes and Curriculum Map** - Complete these tables as a summary of the learning outcomes from your assessment plan and an overview of where learning outcomes are addressed in the program. Use the examples below as models and refer to the explanations beneath each table. Additional resources are available from the [University Center for Assessment, Teaching and Technology](#).



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Learning Outcomes

<p>Learning Outcome #1: Students will describe and apply core AI concepts and techniques to transform and analyze data in business.</p>
<p>Concepts: data exploration and pre-processing concept and principle, data analytical principles, network and graph analysis ideas and principles, big data techniques, machine learning paradigms, deep learning concepts and designs, principle and design of generative AI, critical infrastructure for AI</p>
<p>Competencies: students will have the ability to demonstrate an AI mindset by explaining the value of data, algorithm and infrastructure for AI, challenging outcomes of AI solutions, and providing suggestions for applying AI concepts and ideas within specific business contexts.</p>
<p>Assessment Methods: homework exercises, exam questions. For direct measures, instructors will design homework, quizzes, exams and projects to assess students' learning performance at the course level. Specific rubrics will be developed by instructors to assess each item as appropriate. For indirect measures, we plan to use a survey administered at graduation and to alumni.</p>
<p>Measures: Conduct data pre-processing and exploration (Direct, measured in MIS545) Apply big data techniques to obtain actionable business insights (Direct, measured in MIS584) Apply network and graph analysis to solve business problems (Direct, measured in MIS551) Student survey question asking for the level of agreement with the statement, "the MS program improved my ability to describe and apply technical knowledge for AI in business " (indirect, survey collected at graduation)</p> <ul style="list-style-type: none"> • For direct measures, instructors in designated courses will report a count of students meeting (or not meeting) the measure. • For the indirect measure, we will count how many students responded at each level on a 5-point Likert scale (with >=4 considered as meeting the measure)
<p>Learning Outcome #2: Students will choose and apply appropriate methods and AI tools to solve business problems, and interpret and communicate results.</p>
<p>Concepts: data analysis methods (e.g., clustering, statistical tests, correlation examination, visualization) and tools (e.g., Python library like Numpy, scikit-learn, and Pytorch), machine learning and deep learning methods</p>
<p>Competencies: students will have the ability to demonstrate AI competencies by choosing appropriate AI methods and tools to solve business problems, communicating the results of AI methods and tools with both management and engineering teams, and interpreting the business insights for real-world practices.</p>
<p>Assessment Methods: homework assignments, lab assignments, and exam questions. For direct measures, instructors will design homework, lab assignments, quizzes and exams to assess students' learning performance at the course level. Specific rubrics will be developed by instructors to assess each item as appropriate. For indirect measures, we plan to use a survey administered at graduation and to alumni.</p>



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Measures:

Utilize AI techniques for natural language processing and text mining to analyze and interpret data (Direct, measured in MIS553)

Apply deep learning methods for real-world problems (Direct, measured in MIS548)

Apply machine learning techniques for business intelligence and decision-making (Direct, measured in MIS554)

Survey question asking for the level of agreement (Likert scale) with the statement, “the MS program improved my ability to apply appropriate methods and tools for AI in Business” (indirect, survey collected at graduation)

- For direct measures, instructors in designated courses will report a count of students meeting (or not meeting) the measure.
- For the indirect measure, we will count how many students responded at each level on a 5-point Likert scale (with ≥ 4 considered as meeting the measure)

Learning Outcome #3: Students will describe and apply ethical and regulatory AI frameworks for business problems, and evaluate proposed solutions.

Concepts: history of AI, regulatory frameworks, compliance, ethical use of AI, safety of AI output

Competencies: students will apply AI systems and tools to their field of interest in compliance with existing regulatory and ethical frameworks; furthermore, they will be able to perform cost-benefit analyses of proposed AI solutions and effectively communicate their findings to management

Assessment Methods: homework assignments, written reports, exam questions.

For direct measures, instructors will design homework, quizzes, project reports and exams to assess students’ learning performance at the course level. Specific rubrics will be developed by instructors to assess each item as appropriate.

For indirect measures, we plan to use a survey administered at graduation and to alumni.

Measures:

Describe important developments in the history of AI (Direct, measured in MIS550)

Assess compliance of existing AI organizational policies with regulatory frameworks and ethical standards of AI use (Direct, measured in MIS550)

Evaluate safety of generative AI and quality of AI-generated output (Direct, measured in MIS556)

Survey question asking for the level of agreement (Likert scale) with the statement, “the MS program improved my ability to apply ethical and regulatory frameworks for AI in Business” (Indirect, survey collected at graduation)

- For direct measures, instructors in designated courses will report a count of students meeting (or not meeting) the measure.
- For the indirect measure, we will count how many students responded at each level on a 5-point Likert scale (with ≥ 4 considered as meeting the measure)

Explanation: **Concepts** are the topics that students will learn in the program. **Competencies** are the skills they will learn. A **learning outcome** is their ability to apply the skills to the topics, or to use the skills and the topics together, in an observable way. The **assessment method** is where students will demonstrate the learning outcome, and a **measure** is how data will be pulled from the assessment method. Include both a direct



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and indirect assessment method and measurement for each learning outcome. Competencies and the learning outcomes need to reflect higher level learning: consider using verbs from the Application, Analysis, Synthesis, and Evaluation columns from this list when writing learning outcomes: <https://arizona.app.box.com/s/orx6coex8607hlmnrgl7dznhzjicpit>. We recommend 3-5 Learning Outcomes for a degree program.

Curriculum Map

	MIS 545	MIS 548	MIS 550	MIS 551	MIS 556	MIS 584	MIS 552	MIS 553	MIS 554	MIS 555	
LO #1: Students will apply core technical knowledge for AI in Business	I	R, M		I	R	R	R	R	R	R	
LO #2: Students will apply appropriate methods and tools for AI in Business	R	I, R		R	R, M	R	R	R	R	R	
LO #3: Students will apply ethical and regulatory frameworks for AI in Business			R, M		I						

Explanation: The curriculum map lists the required courses for the program and indicates where each LO will be introduced (I), reinforced (R), and mastered (M). This is important to show that you are including adequate teaching of the skills and concepts to support the LOs. Each row (LO) should have at least one I, R, and M in it. Usually (but not always) there is more than one R. Usually (but not always) there is only one I and one M. Generally, Is come first, followed by Rs, and Ms are last. Each column (class) should have at least one letter in it, but not every box needs to be filled in

VII. **PROGRAM ASSESSMENT PLAN-** using the table below, provide a schedule for program evaluation 1) while students are in the program and 2) after completion of the major. Add rows as needed. Delete **EXAMPLE** rows.

Assessment Measure	Source(s) of Evidence	Data Collection Point(s)
Annual Review of learning outcomes assessments	Instructor reported information connected to the assessment methods listed above	Reported by semester; reviewed annually in August.



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Job Placement Statistics	Student/Alumni Survey	At graduation and as part of alumni survey
Academic Program Review	Reviewers' responses	Every 7 years

VIII. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was used to arrive at the numbers?

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Number of Students	20	35	50	60	70

Data/evidence used to determine projected enrollment numbers:

These numbers are based on our experience with the MS Cybersecurity program, which is also a focused technology-oriented degree. Based on that data, we expect to have 20 students in the first year, followed by this growth trajectory, which levels out at about 70 students steady-state.

IX. ANTICIPATED DEGREES AWARDED- complete the table below, beginning with the first year in which degrees will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates. Use [National Center for Education Statistics College Navigator](#) to find program completion information of peer institutions offering the same or a similar program.

PROJECTED DEGREES AWARDED ANNUALLY					
	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year



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Number of Degrees	5	18	22	28	31
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Data/evidence used to determine number of anticipated degrees awarded annually: We are basing this information on the details from our MS Cybersecurity program, which is also a focused technology-oriented degree



ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

Appendix A. Minor Requirements. Complete if requesting a corresponding minor. Delete **EXAMPLE** column and verbiage as it applies to your level degree (i.e., undergraduate vs graduate) before submitting.

Not Applicable



ADDITIONAL INFORMATION FORM

To be used once preliminary proposal has been approved.

Appendix B. Emphasis Print Information-if applicable, complete the table below to indicate if proposed emphases should be printed on transcript and diploma. Add rows as needed. Note: emphases are displayed on transcript and diplomas as “ _____ Emphasis”. Delete **EXAMPLE** row before submitting.

Not Applicable



New Academic Program
PEER COMPARISON

Select three peers (if possible/applicable) for completing the comparison chart from [ABOR-approved institutions](#), [AAU members](#), and/or other relevant institutions recognized in the field. The comparison programs are not required to have the same degree type and/or title as the proposed UA program. Information for the proposed UA program must be consistent throughout the proposal documents. Minors and Certificates may opt to include only 2 peer comparisons.

Program name, degree, and institution	Proposed UA Program: MS in AI for Business	Arizona State University	UT Austin	Johns Hopkins
Current number of students enrolled		(Program launched in fall 2024)	unknown	unknown
Program Description	The MS in AI for Business will offer a unique opportunity to acquire knowledge and skills in AI methods and applications as well as managerial insights related to AI governance, including ethical use of AI and regulatory compliance. Emphasizing practical, industry-specific application of AI, the degree covers a broad scope of real-world applications across diverse disciplines	The goal of the program is to equip leaders with a business-aligned framework and strategies for implementing AI. The program delivers both technical skills and business skills.	The UT Austin online master’s degree in AI prepares you to stand out in this fast-growing field through one of the first AI master’s programs available 100% online.	Advance your career with an online master's degree in Artificial Intelligence from Johns Hopkins University. From topics in machine learning and natural language processing to expert systems and robotics, start here to define your career as an artificial intelligence engineer.

	such as healthcare management, cybersecurity, and networks.			
Target Careers	AI consultant, AI Specialist, Data analyst, Machine learning specialist, AI/ML Software engineer, business intelligence developer	AI consultant, AI specialist, chatbot developer, data analyst, machine learning engineer		
Emphases? (Yes/No) List, if applicable	No	No	No	No
Minimum # of units required	30	30	30	30
Level of Math required (if applicable)	Basic knowledge in statistics, Python, SQL	N/A	Bachelor's degree in AI or related field (e.g., electrical or computer engineering)	Three to five semesters of Calculus; Linear Algebra, Probability Statistics, programming (Python or Java)
Level of Second Language required (if applicable)	N/A	N/A	N/A	N/A
Pre-Major? (Yes/No) If yes, provide requirements.	No	No	No	No
Special requirements to declare/gain admission? (i.e. pre-requisites, GPA, application, etc.)	Minimum cumulative GPA of 3.00. Statement of purpose, resume, letters of recommendation,	Minimum cumulative GPA of 3.00. Complete written statement, short answer questions, resume, letter of recommendation, and	Minimum cumulative GPA of 3.00. Complete written statement, short answer questions,	Minimum cumulative GPA of 3.00. Complete written statement, short answer questions,

	proof of English proficiency.	proof of English proficiency.	resume, and proof of English proficiency.	resume, and proof of English proficiency.
Internship, practicum, or applied/experiential requirements? If yes, describe.	No	No	No	N/A

Additional questions:

1. How does the proposed program align with peer programs? Briefly summarize the similarities between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

Both the ASU and the UA programs emphasize the significance of AI in today's business world by highlighting topics such as machine learning, ethics, and governance, and connecting AI to strategic business objectives.

In addition, the UA program offers an opportunity for students to gain applied knowledge within a set of sub-disciplines (e.g., cybersecurity, healthcare). The UA program is built on 35 years of experience in AI research (the Eller MIS AI Lab was established in 1989). The faculty who are tapped to participate have themselves conducted research in AI and, in some cases, have consulting or work experience in the area. We also have a class dedicated to policy and ethics, taught by an internationally respected faculty member who specializes in privacy and ethics.

The programs at UT Austin and Johns Hopkins, along with the other programs we found in our search, have more of an engineering/computer science orientation – with very high quantitative background required. Note that Northwestern, University of Michigan, Dearborn offer similar programs in their Engineering college, while Carnegie Melon's program is in their college of computer science. Other programs offer specializations within the main degree (e.g., MS Engineering – AI; MS Computer Science – AI). The majority of the competitors are very highly technical with little to no connection to business.

2. How does the proposed program stand out or differ from peer programs? Briefly summarize the differences between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

While ASU's program highlights business processes and AI, the University of Arizona's MS in AI for Business takes more of an industry focus and enables students to focus in diverse disciplines such as healthcare management, cybersecurity, and platforms (e.g., commerce). The faculty teaching in the program have established reputations in AI, with experience teaching and researching in AI. The University's reputation in Management Information Systems (top five program undergraduate, graduate, and online) also helps to distinguish the program from our peers.

The ASU program is a full-time in person program. We intend to launch the program at UA online, with a possible addition of an in person program in the future, should there be sufficient demand. By launching online, we can serve a different set of students than those who would choose full-time. The online program is designed for working professionals who have some technical knowledge and who want to expand into the field of AI. The ASU program indicates that a technical background is not necessary, while the UA program expects students to have some technical background at the start. Students in the UA program without a business background will be able to fill that gap by taking 6 credits from among our offerings in the online MBA program. This is not a requirement for the ASU program.

3. How do these differences make this program more applicable to the target student population and/or a better fit for the University of Arizona?

The tradition of AI teaching and research in the MIS Department help it to stand out. The courses are not a reaction to what is currently happening in the market, but rather built upon decades of experience in AI. The online delivery allows us to reach working professionals in a variety of industries who want to expand their knowledge of AI without having to leave their current employment.



BUDGET PROJECTION FORM

Name of Proposed Program or Unit: Master of Science in AI for Business

Budget Contact Person: Jennifer Paine	Projected		
	1st Year 2025 - 2026	2nd Year 2026 - 2027	3rd Year 2027 - 2028
METRICS			
Net increase in annual college enrollment UG			
Net increase in college SCH UG			
Net increase in annual college enrollment Grad	20	35	50
Net increase in college SCH Grad ¹	360	630	900
Number of enrollments being charged a Program Fee	-	-	-
New Sponsored Activity (MTDC)			
Number of Faculty FTE			
FUNDING SOURCES			
<u>Continuing Sources</u>			
UG AIB Revenue	-	-	-
Grad Tuition Revenue ²	479,520	839,160	1,198,800
Program Fee Revenue (net of revenue sharing) ³	-	-	-
F and A AIB Revenues	-	-	-
Reallocation from existing College funds (attach description)	-	-	-
Other Items (attach description)			
Total Continuing	\$ 479,520	\$ 839,160	\$ 1,198,800
<u>One-time Sources</u>			
College fund balances			
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
Total One-time	\$ -	\$ -	\$ -
TOTAL SOURCES	\$ 479,520	\$ 839,160	\$ 1,198,800
EXPENDITURE ITEMS			
<u>Continuing Expenditures</u>			
Faculty ⁴	135,000	165,000	170,000
Other Personnel ⁵	57,939	66,339	66,339
Employee Related Expense ⁶	56,108	67,145	68,745
Graduate Assistantships			
Other Graduate Aid	-	-	-
Operations (materials, supplies, phones, etc.)	5,000	5,000	5,000
Additional Space Cost	-	-	-
Other Items (attach description)			
Total Continuing	\$ 254,047	\$ 303,484	\$ 310,084
<u>One-time Expenditures</u>			
Construction or Renovation	-	-	-
Start-up Equipment	-	-	-
Replace Equipment	-	-	-
Library Resources	-	-	-
Other Items (attach description) ⁷	118,800	26,400	-
Total One-time	\$ 118,800	\$ 26,400	\$ -
TOTAL EXPENDITURES	\$ 372,847	\$ 329,884	\$ 310,084
Net Projected Fiscal Effect	\$ 106,673	\$ 509,276	\$ 888,716

Notes:

¹ Assume each student takes 3 credits every 7 weeks; some will take more and others will take a break now and then - it should even out

² Gross revenue (\$1332 / credit hour)

³ No fees, as it will be online initially (first three years)

⁴ 10 courses in the program - see proposed carousel for classes plus cost of build in year one (based on 100% overload rate)

⁵ Program Manager time @ 25% of \$80,556 + facilitator positions (allocating 25% cost of current program manager to this program)

⁶ 32% for full-time faculty and staff; 17.1% for facilitators

⁷ Course development for courses never offered online before (pay + ERE)



August 8, 2024

Sue Brown, Ph.D.
Professor and Department Head
Management Information Systems
Eller College of Management
University of Arizona

Dear Sue,

The College of Applied Science and Technology (CAST) supports the Master of Science in Artificial Intelligence (AI) for Business being proposed by the Management Information Systems department. Much like the domains of cyber, big data, and analytics, the breadth of AI and Machine Learning (ML) allows for several complimentary programs across the university. The Eller MIS focus of AI to solve business problems is a natural fit, and one we endorse fully.

The Cyber, Intelligence, and Information Operations (CIIO) department recently created and gained approval for two AI courses, CYBV 525 and 535, as electives within our Master of Science in Cyber and Information Operations degree. We are happy to have these, and future AI/ML courses we develop in our focus areas included in the MS in AI for Business program in the future.

We look forward to future collaborations with the Management Information Systems department to ensure student success in both programs and foster a strong research partnership among faculty.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Pauli'.

Josh Pauli, Ph.D.
Professor and Department Head
Cyber, Intel, and Info Operations
College of Applied Science & Technology
University of Arizona

A handwritten signature in black ink, appearing to read 'Nicole Kontak'.

Nicole Kontak, Ph.D.
Assistant Dean, Curricular & Academic Affairs
College of Applied Science & Technology
University of Arizona



ELECTRICAL & COMPUTER ENGINEERING

College of Engineering
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ece.engineering.arizona.edu



COLLEGE OF ENGINEERING

Electrical & Computer
Engineering

August 7, 2024

Dr. Sue Brown
Stevie Eller Professor and Department Head
Management Information Systems
Eller College of Management
The University of Arizona
McClelland Hall 430Q

Dear Dr. Brown,

We are writing to express our support for the online MS in Artificial Intelligence for Business degree proposed by the Department of Management Information Systems, Eller College of Management.

We look forward to opportunities to collaborate with this new program through joint course offerings and research projects.

Sincerely,

A handwritten signature in blue ink, appearing to read 'M. Wu'.

Michael H. Wu (Aug 7, 2024 13:05 PDT)

Michael H. Wu, Ph.D., IEEE Fellow
Kenneth Von Behren Professor and Department Head
Department of Electrical and Computer Engineering
University of Arizona

A handwritten signature in blue ink, appearing to read 'D. Hahn'.

David W. Hahn, Ph.D.
Craig M. Berge Dean of Engineering
Professor and Eminent Scholar,
Aerospace and Mechanical Engineering
University of Arizona



THE UNIVERSITY OF ARIZONA

College of
Information Science

1103 E. 2nd St.
Harvill Building, Room 409
P.O. Box 210076
Tucson, AZ 85721

520-621-3565
infosci.arizona.edu

August 29, 2024

Susan Brown
Stevie Eller Professor and Department Head
Management Information Systems

Dear Dr. Bryan:

This is a letter of support for your new program, Online Master's Degree Program in Artificial Intelligence for Business. This will be a great new opportunity for students at Eller, contributing to the education and business in the state of Arizona and beyond. As you had suggested, INFO 557: Neural Networks would be a great fit with your program as would INFO 555 Applied NLP.

There are no conflicts with the College of Information Science given your focus on business applications. If you were to have the capacity in some classes, I am certain that some of our students would be qualified and interested in registering.

Sincerely,

P. Bryan Heidorn, Professor
Associate Dean for Research and Graduate Academic Affairs
College of Information Science

September 11, 2024

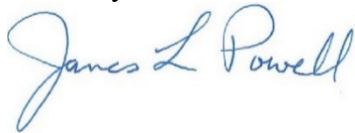
Professor Susan Brown, Head
Department of Management Information System
University of Arizona
Tucson, AZ 85721-0108

Dear Sue:

I am writing to confirm that the Department of Economics supports the establishment of the MS AI for Business program in your department, and we would indeed like one of our master's level courses, ECON 511A, to be included in the list of electives for that program. The subject matter of that course, econometrics, is a fundamental building block for machine learning methods, which in turn are key components in artificial intelligence. Although our department's master's degree program is currently paused, ECON 511A is a required course for the MS program in the Department of Business Analytics, and we are committed to offering this course every academic year.

If you need any further information or clarification, I will be happy to provide it.

Sincerely,



James L. Powell
Eller Professor and Head
Department of Economics
University of Arizona





COMPUTER SCIENCE

University of Arizona
Gould-Simpson 805
1040 E. 4th Street
Tucson, AZ 85721
riloff@arizona.edu

September 3, 2024

Dr. Susan Brown
Stevie Eller Professor and Department Head
Management Information Systems

Dear Professor Brown,

I am happy to express support for the Master's of AI in Business degree being proposed by the Department of Management Information Systems. Artificial Intelligence is a rapidly growing field and AI technologies are becoming an important part of many sectors of our society. Consequently, I fully expect that this degree will receive strong interest from business students and will be of great value to them in their careers.

In the Department of Computer Science, we recently launched a new B.S. degree in Artificial Intelligence because we also view AI as a critical technology for the future and a subject of great interest to students. Our AI degree focuses on teaching students the fundamental computer science principles that underlie AI technologies as well as the computer science skills required to build AI software and tools for specialized subareas of AI, such as machine learning, natural language processing, and computer vision. In contrast, the proposed Master's of AI in Business degree focuses on providing students in the business school with a general understanding of AI technologies and their capabilities, and on teaching students how to apply AI tools to solve important problems in the business domain. Consequently, I view this proposed degree as complementary to our goals in the computer science department. Even if we pursue an M.S. in AI degree in the future, our degree would focus on fundamental computer science knowledge and AI research expertise that is the basis for the creation of new AI technologies.

The proposed degree should attract more students who are interested in AI to the University of Arizona, which will be beneficial for all of us. I wish you much success with this new degree offering.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ellen Riloff'.

Ellen Riloff
Professor and Head
Department of Computer Science



NEW ACADEMIC PROGRAM – MAJOR
Supplemental Info Form

NOTE: This is being added to the proposal after committees, including but not limited to Graduate Programs Executive Review (GPERC) and Graduate College Academic Administrator’s Council (GCAAC) viewed and commented on the document. Below are their questions and the responses given by the proposing department/college.

GPERC Review/Questions:

- 1) Under viability they state, “the MIS Department’s recruiting plans are focused on faculty who have expertise in AI”. I think they need to add some more details from their hiring plan that would affect this degree.
 - a) The job posting states, “The University of Arizona Management Information Systems (MIS) Department is recruiting a tenure-eligible Assistant Professor for the 2025-2026 academic year. Areas of emphasis in the department include AI, analytics, cyber security, and healthcare.” In addition, “Preference will be given to candidates with outstanding research and teaching background that align well with the MIS department’s various areas of research and teaching, particularly in AI, analytics, data science and/or design science areas.” Finally, “The appointee will teach courses at the graduate and undergraduate levels in traditional and online classrooms.”
- 2) Under viability they state “we do not anticipate needing additional staff for the first three years” despite increase the staff:student from 1:90 to 1:115. I’d like them to add a sentence regarding the ratio where they would hire another staff member.
 - a) The combined MS MIS and MS Cybersecurity programs peaked at just under 230 students. We are now closer to 180 across the programs. The current staff were able to scale to 230, but we do believe that is nearing the limit – so, once we expand to 1:115, we anticipate hiring additional (at least part time) support. If we were to have 50 students in year one, we would likely need to add additional support (assuming MIS and Cyber stay steady) immediately, but the budget would support the addition of the staff at that enrollment size.
- 3) I am concerned about their ability to support the program with current faculty – the 2 for 1 teaching approach seems like it might lead to burn-out or a sense of teaching inequality that might affect student experience?
 - a) The college has committed to provide additional course support that will assist faculty in maintaining an instructional experience that is consistent with current best practices. Specifically, the faculty are given facilitators to help with grading, office hours, and technical support. MIS offers these facilitators for 30 students, and sometimes fewer depending on the technical complexity of the course. The college is also planning to monitor the student experience and the faculty experience with this new model.

- 4) Under pre-admissions expectations it states, “Applicants who have not received the equivalent of 6 credit hours in business courses are required to take the equivalent of 6 credits of foundational business courses”. A list of courses that would fulfill this requirement would be helpful.
 - a) Updated in additional information form.
- 5) The current set up for MSMIS is a faculty advisement model; although it does not sound like they are following that model. This sounds to me like the program might consider a professional master’s program advisement model. I’ve attached the policy document for them to consider. MBA has a professional advisement model.
 - a) This is an interesting point and I’m not sure what to do with it. I think in many ways this assessment is correct, but I’m not sure where that belongs – and if it requires us to make an official change to all MS programs or is it just for this one? Also, does it change anything in the application?